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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,994	12/31/2001	Yung-Chiang Chung	64.600-093	9619

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EXAMINER
DRODGE, JOSEPH W

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	10/038,994	CHUNG ET AL.	
	Examiner	Art Unit	
	Joseph W. Drodge	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *9-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *9-18* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

NON-FINAL REJECTION

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-8, drawn to a microfluidic mixer having oblique channels, classified in class 366, subclass 336.

II. Claims 9-16, drawn to a reactor having baffles and method of use thereof, classified in class 422, subclass 129.

III. Claims 17 and 18, drawn to method and apparatus for nucleic acid extraction, classified in class 435, subclass 7.

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a mixer where the mixed fluids do not react such that no baffle is needed to further increase turbulence. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II or Group III, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Randy Tung on Septermber 24, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-8. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burns et al patent publication US 2003/0145894 in view of Desai et al patent 5,921,678. Burns et al disclose a miniaturized, capillary scale apparatus and use therof to mix two or more reactants (page 1, paragraph 2), the apparatus having a substrate with two inlet channels 2 and 3 that may meet obliquely to effect swirling (pages 2-3, paragraph 31 and see page 5, paragraph 52 regarding "vortex mixing"), there being an elongated aperture/slit 4/5 adjoining the inlet channels (page 2, paragraph 15).

The claims differ in requiring the apparatus used to qualify as "microfluidic". Burns et al itself suggests advantage of microfluidic apparatus (page 5, paragraph 50) and references Desai et al (page 1, paragraph 7). Desai et al explicitly teach a porous microfluidic reactor/mixer with similar design to that of the Burns et al apparatus (column 3, line 53-column 4, line 26). It would have been obvious to one of ordinary skill in the art to have manufactured and scaled/down the apparatus of Burns et al so as to be microfluidic, as taught by Desai et al, in order to increase manufacturing efficiency.

Regarding claims 2 and 6 cover plates with openings centered over apertures/channel openings of adjacent layers are taught in Burns et al (page 2, paragraph 17 and page 5, paragraph 51) as well as in Desai et al (column 4, lines 49-58).

Regarding claims 3 and 7, substrates of semi-conductor material are most clearly taught in Desai et al at column 3, lines 54-57.

Regarding claims 4 and 8, apertures of varied geometric shapes are most clearly suggested by Desai et al at column 4, lines 24-26.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bennett et al patent 6,494,614 is of interest for a microfluidic reactor with mixing layers. Lee et al patent 6,146,103 is of interest for a microfluidic mixer with substrate and adjacent glass plate having obliquely intersecting mixing channels (figure 8). Chung patent 6,331,073 is of interest for microfluidic mixers with circular swirl chambers.

Any inquiry concerning this communication or other matters pertaining to prosecution of this application should be directed to Examiner Joseph Drodge at telephone number (703) 308-0403 Monday-Friday between the hours of 8:30 and 4:45. The fax number for the examining Group is (703) 872-9306.

JWD

September 26, 2003

JOSEPH DRODGE
PRIMARY EXAMINER